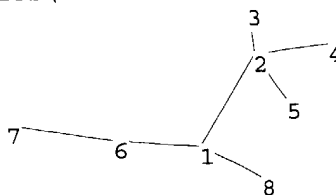
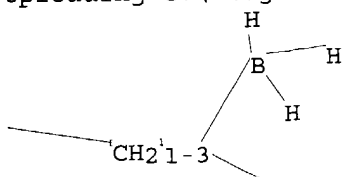


=>

Uploading C:\Program Files\Stnexp\Queries\10625982.str



chain nodes :

1 2 3 4 5 6 7 8

chain bonds :

1-2 1-6 1-8 2-3 2-4 2-5 6-7

exact/norm bonds :

1-8

exact bonds :

1-2 1-6 2-3 2-4 2-5 6-7

Match level :

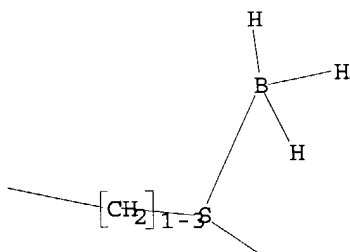
1:CLASS 2:CLASS 3:CLASS 4:CLASS 5:CLASS 6:CLASS 7:CLASS 8:CLASS

L1 STRUCTURE UPLOADED

=> d

L1 HAS NO ANSWERS

L1 STR



Structure attributes must be viewed using STN Express query preparation.

=> s l1

SAMPLE SEARCH INITIATED 15:18:34 FILE 'REGISTRY'

SAMPLE SCREEN SEARCH COMPLETED - 174 TO ITERATE

100.0% PROCESSED 174 ITERATIONS  
SEARCH TIME: 00.00.01

0 ANSWERS

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*  
BATCH \*\*COMPLETE\*\*

PROJECTED ITERATIONS: 2689 TO 4271  
PROJECTED ANSWERS: 0 TO 0

L2 0 SEA SSS SAM L1

=> s l1 full

FULL SEARCH INITIATED 15:18:37 FILE 'REGISTRY'  
 FULL SCREEN SEARCH COMPLETED - 4043 TO ITERATE

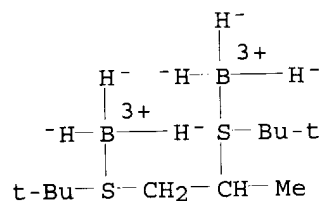
100.0% PROCESSED 4043 ITERATIONS  
 SEARCH TIME: 00.00.01

25 ANSWERS

L3 25 SEA SSS FUL L1

=> d scan

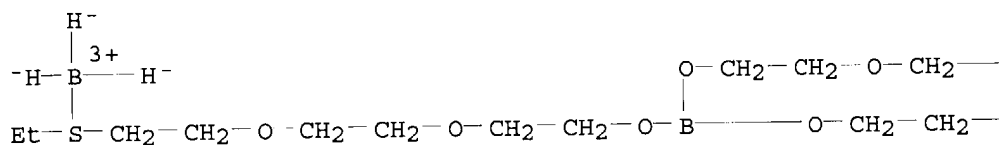
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, hexahydro[μ-[2,2'-[(1-methyl-1,2-ethanediyl)bis(thio)]bis[2-methylpropane]-S:S']]di- (9CI)  
 MF C11 H30 B2 S2  
 CI CCS



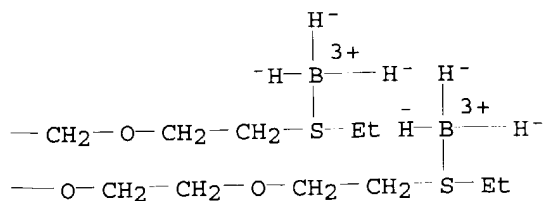
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):10

L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[μ<sub>3</sub>-[tris[2-[2-[2-(ethylthio-κS)ethoxy]ethoxy]ethyl] orthoborate]]tri- (9CI)  
 MF C24 H60 B4 O9 S3  
 CI CCS

PAGE 1-A

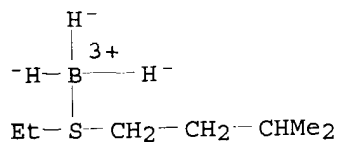


PAGE 1-B

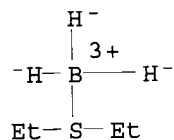


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN

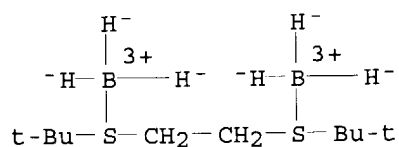
IN Boron, [1-(ethylthio)-3-methylbutane]trihydro-, (T-4)- (9CI)  
 MF C7 H19 B S  
 CI CCS



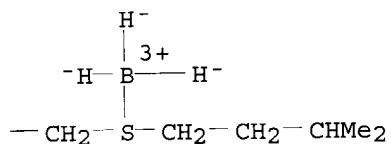
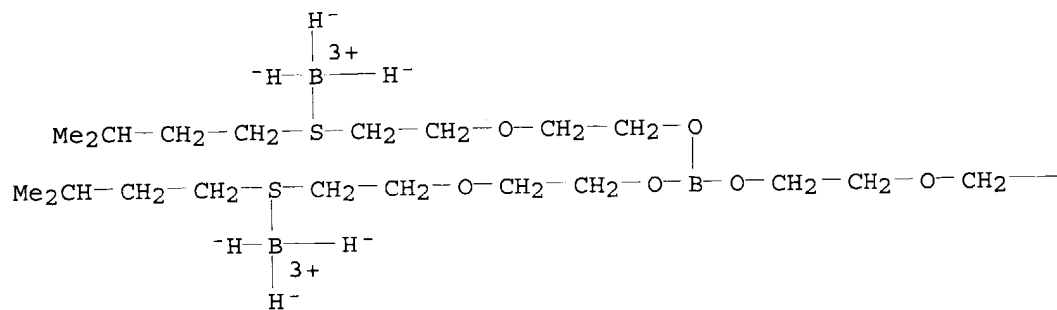
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[ethane]]-, (T-4)- (9CI)  
 MF C4 H13 B S  
 CI CCS



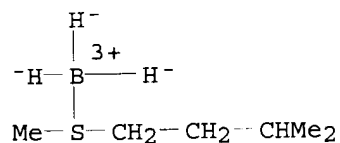
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [ $\mu$ -[2,2'-[1,2-ethanediylbis(thio- $\kappa$ S)]]bis[2-methylpropane]]hexahydrodi- (9CI)  
 MF C10 H28 B2 S2  
 CI CCS



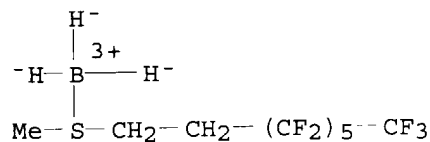
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[ $\mu$ 3-[tris[2-[2-[(3-methylbutyl)thio- $\kappa$ S]ethoxy]ethyl] orthoborate]]tri- (9CI)  
 MF C27 H66 B4 O6 S3  
 CI CCS



L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[3-methyl-1-(methylthio)butane]-, (T-4)- (9CI)  
 MF C6 H17 B S  
 CI CCS

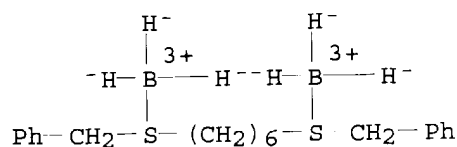


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-(methylthio-  
 κS)octane]-, (T-4)- (9CI)  
 MF C9 H10 B F13 S  
 CI CCS

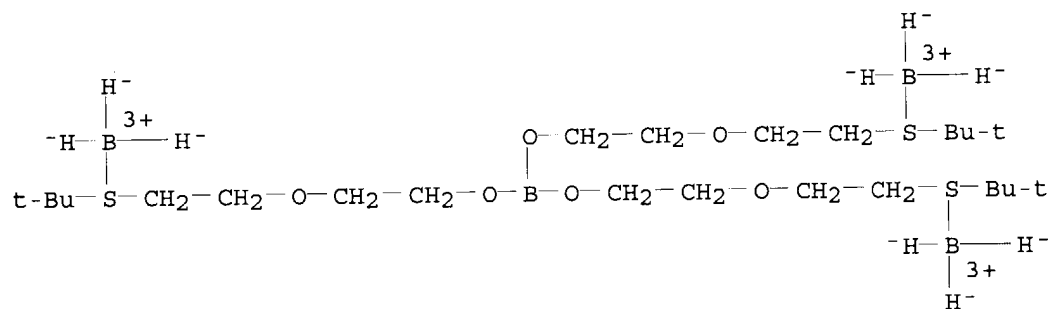


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [μ-[1,1'-[1,6-hexanediylbis(thiomethylene)]bis[benzene]-  
 S:S']]hexahydrodi- (9CI)

MF C20 H32 B2 S2  
CI CCS

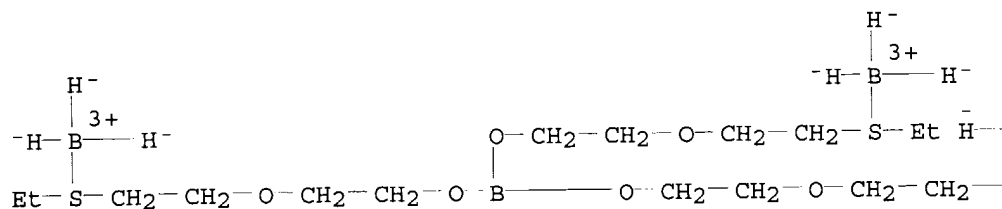


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
IN Boron, nonahydro[μ<sub>3</sub>-[tris[2-[2-[(1,1-dimethylethyl)thio-κS]ethoxy]ethyl] orthoborate]]tri- (9CI)  
MF C24 H60 B4 O6 S3  
CI CCS

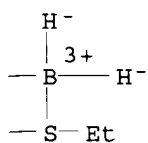


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
IN Boron, nonahydro[μ<sub>3</sub>-[tris[2-[2-(ethylthio-κS)ethoxy]ethyl] orthoborate]]tri- (9CI)  
MF C18 H48 B4 O6 S3  
CI CCS

PAGE 1-A

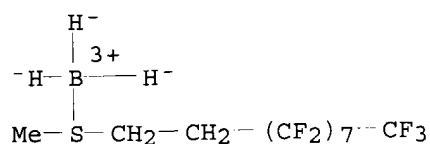


PAGE 1-B

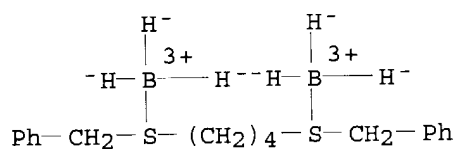


HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):10

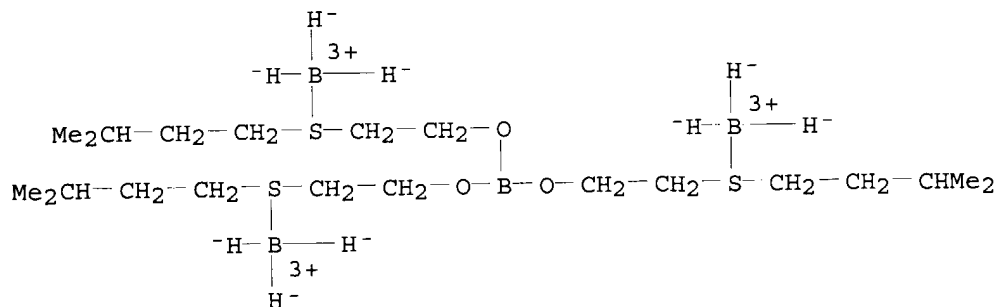
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-  
 $\kappa$ S)decane]trihydro-, (T-4)- (9CI)  
 MF C11 H10 B F17 S  
 CI CCS



L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [ $\mu$ -[1,1'-[1,4-butanediylbis(thiomethylene)]bis[benzene]-  
 S:S']]hexahydro- (9CI)  
 MF C18 H28 B2 S2  
 CI CCS

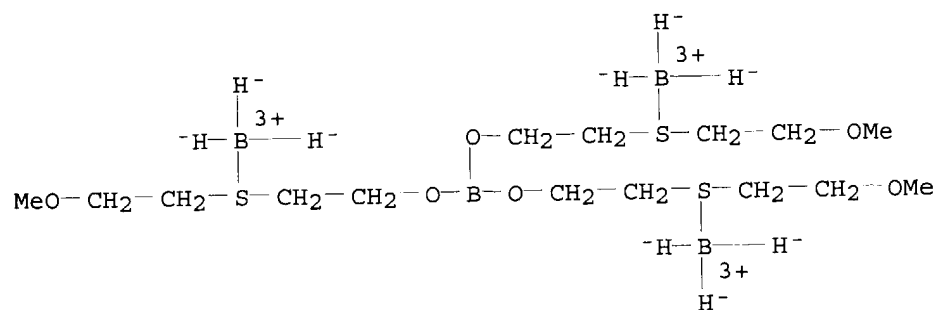


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[ $\mu$ 3-[tris[2-[(3-methylbutyl)thio- $\kappa$ S]ethyl]  
 orthoborate]]tri- (9CI)  
 MF C21 H54 B4 O3 S3  
 CI CCS

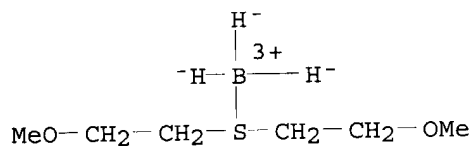


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[ $\mu$ 3-[tris[2-[(2-methoxyethyl)thio- $\kappa$ S]ethyl]  
 orthoborate]]tri- (9CI)  
 MF C15 H42 B4 O6 S3

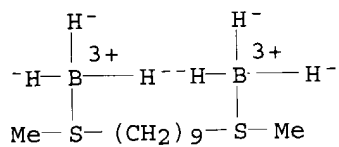
CI CCS



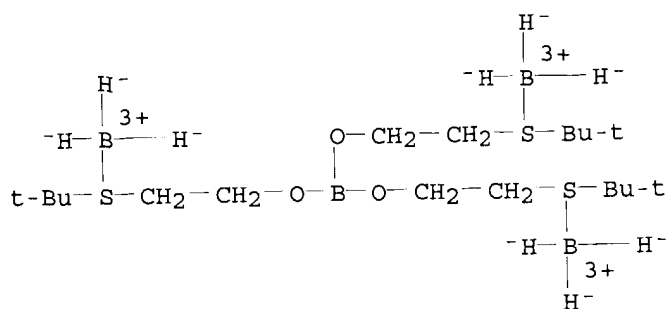
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-(thio-κS)bis[2-methoxyethane]]-, (T-4)- (9CI)  
 MF C6 H17 B O2 S  
 CI CCS



L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [μ-[1,9-bis(methylthio)nonane-S:S']]hexahydrodi- (9CI)  
 MF C11 H30 B2 S2  
 CI CCS

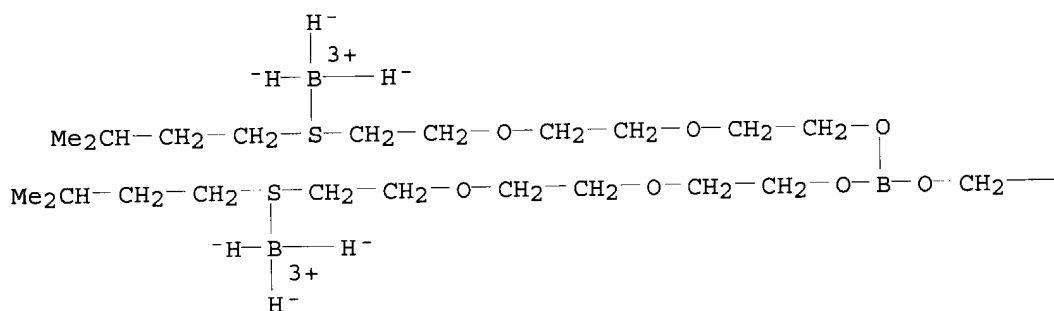


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[μ3-[tris[2-[(1,1-dimethylethyl)thio-κS]ethyl]orthoborate]]tri- (9CI)  
 MF C18 H48 B4 O3 S3  
 CI CCS

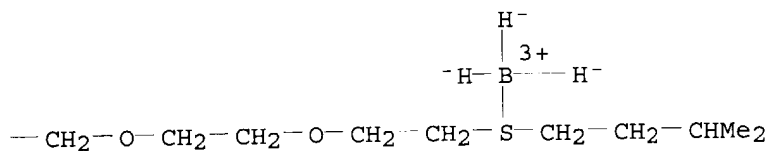


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[μ<sub>3</sub>-[tris[2-[2-[2-[(3-methylbutyl)thio-  
 κS]ethoxy]ethoxy]ethyl] orthoborate]]tri- (9CI)  
 MF C33 H78 B4 O9 S3  
 CI CCS

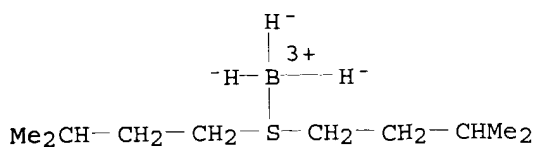
PAGE 1-A



PAGE 1-B

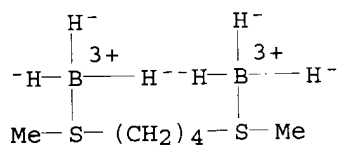


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[3-methylbutane]]-, (T-4)- (9CI)  
 MF C10 H25 B S  
 CI CCS



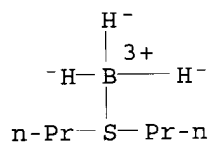


L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [ $\mu$ -[1,4-bis(methylthio)butane-S:S']]hexahydrodi- (9CI)  
 MF C6 H20 B2 S2  
 CI CCS



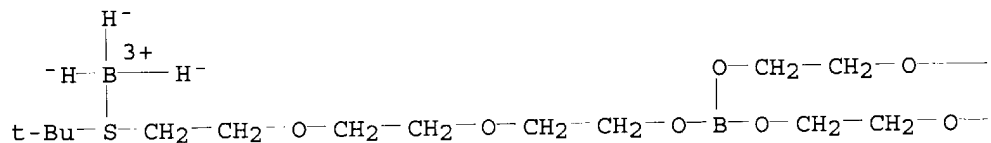
HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):10

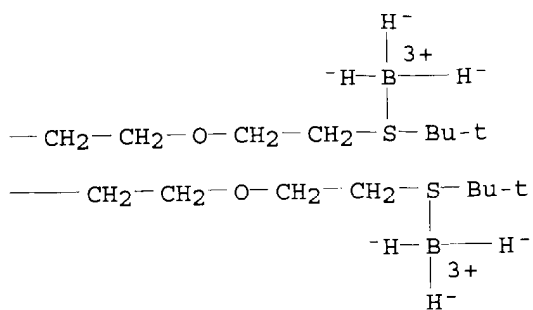
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[propane]]-, (T-4)- (9CI)  
 MF C6 H17 B S  
 CI CCS



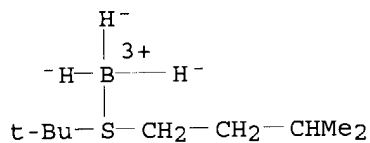
L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, nonahydro[ $\mu$ 3-[tris[2-[2-[2-[(1,1-dimethylethyl)thio- $\kappa$ S]ethoxy]ethoxy]ethyl] orthoborate]]tri- (9CI)  
 MF C30 H72 B4 O9 S3  
 CI CCS

PAGE 1-A

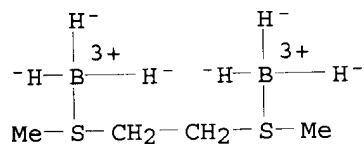




L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [1-[(1,1-dimethylethyl)thio]-3-methylbutane]trihydro-, (T-4)- (9CI)  
 MF C9 H23 B S  
 CI CCS



L3 25 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [ $\mu$ -[1,2-bis(methylthio)ethane-S:S']]hexahydro- (9CI)  
 MF C4 H16 B2 S2  
 CI CCS

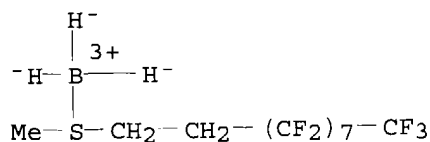


ALL ANSWERS HAVE BEEN SCANNED

=> s l3 and 1/b  
 263766 1/B  
 L4 9 L3 AND 1/B

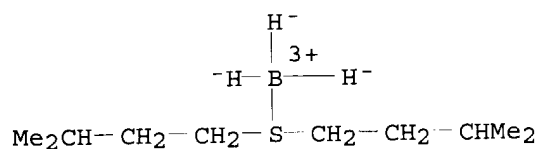
=> d scan

L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio- $\kappa$ S)decane]trihydro-, (T-4)- (9CI)  
 MF C11 H10 B F17 S  
 CI CCS

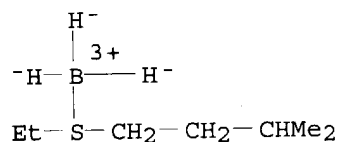


HOW MANY MORE ANSWERS DO YOU WISH TO SCAN? (1):10

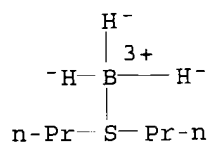
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[3-methylbutane]]-, (T-4) - (9CI)  
 MF C10 H25 B S  
 CI CCS



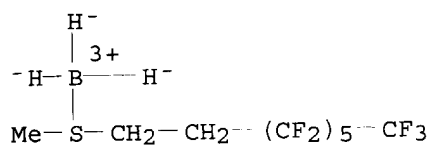
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [1-(ethylthio)-3-methylbutane]trihydro-, (T-4) - (9CI)  
 MF C7 H19 B S  
 CI CCS



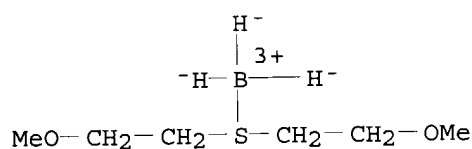
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[propane]]-, (T-4) - (9CI)  
 MF C6 H17 B S  
 CI CCS



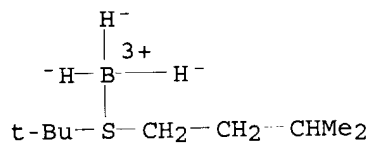
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-(methylthio- $\kappa$ S)octane]-, (T-4) - (9CI)  
 MF C9 H10 B F13 S  
 CI CCS



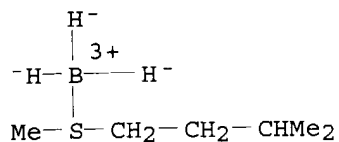
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-(thio-κS)bis[2-methoxyethane]]-, (T-4)- (9CI)  
 MF C6 H17 B O2 S  
 CI CCS



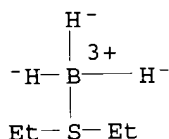
L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, [1-[(1,1-dimethylethyl)thio]-3-methylbutane]trihydro-, (T-4)- (9CI)  
 MF C9 H23 B S  
 CI CCS



L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[3-methyl-1-(methylthio)butane]-, (T-4)- (9CI)  
 MF C6 H17 B S  
 CI CCS



L4 9 ANSWERS REGISTRY COPYRIGHT 2004 ACS on STN  
 IN Boron, trihydro[1,1'-thiobis[ethane]]-, (T-4)- (9CI)  
 MF C4 H13 B S  
 CI CCS



ALL ANSWERS HAVE BEEN SCANNED

=> file caplus  
COST IN U.S. DOLLARS

SINCE FILE ENTRY	TOTAL SESSION
160.27	160.90

FULL ESTIMATED COST

FILE 'CAPLUS' ENTERED AT 15:19:22 ON 12 MAY 2004  
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 12 May 2004 VOL 140 ISS 20  
FILE LAST UPDATED: 11 May 2004 (20040511/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l4  
L5

7 L4

=> d ibib abs hitstr 1-7

L5 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:101171 CAPLUS

DOCUMENT NUMBER: 140:163242

TITLE: Preparation of recyclable fluorous borane-sulfides and their use in the large-scale hydroboration of alkenes or alkynes and reduction of organic functional groups

INVENTOR(S): Crich, David C.; Neelamkavil, Santhosh

PATENT ASSIGNEE(S): The Board of Trustees of the University of Illinois, USA

SOURCE: PCT Int. Appl., 40 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

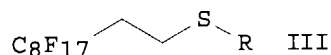
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004011472	A2	20040205	WO 2003-US22984	20030724
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

PRIORITY APPLN. INFO.: US 2002-398414P P 20020725

OTHER SOURCE(S): MARPAT 140:163242

GI



AB The invention refers to recyclable fluorous borane-sulfide compds. of formula I [wherein: R<sub>m</sub> = fluorinated alkyl; R = alkyl, -(CH<sub>2</sub>)<sub>2</sub>-R<sub>m</sub>; n = 1-3] useful for large-scale hydroboration of alkenes or alkynes, or reduction of organic functional groups. To overcome disadvantages (such as liberation of stoichiometric amts. of extremely volatile, foul-smelling, and environmentally unacceptable Me<sub>2</sub>S) associated with prior synthetic methods using a borane-sulfide complex, the invention proposes the use of similar fluorous sulfides as readily prepared, odorless, nonflammable sulfides for complexation and stabilization of borane. An important addnl. feature of the invention is a recovery of the fluorous sulfides with high yields, followed by boronation to regenerate I. Fluorous borane-sulfide II was prepared via reaction of potassium thioacetate with C<sub>8</sub>F<sub>17</sub>(CH<sub>2</sub>)<sub>2</sub>I, substitution of the acetyl-group of obtained compound III (R = Ac) by Me (using NaOMe and MeI), and subsequent boronation of IV (III, R = Me). For instance, 2-MeC<sub>6</sub>H<sub>4</sub>(CH<sub>2</sub>)<sub>2</sub>NH<sub>2</sub> was prepared via reduction of 2-MeC<sub>6</sub>H<sub>4</sub>CH<sub>2</sub>CN by a

1:1 mixture of compds. II and IV with a yield of 81% (88% of IV was recovered).

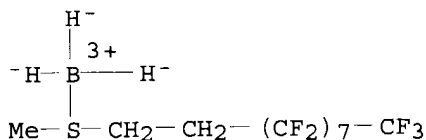
IT **478308-95-1P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of recyclable fluorous borane-sulfides and their use in large-scale hydroboration of alkenes or alkynes and reduction of organic functional groups)

RN 478308-95-1 CAPLUS

CN Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)

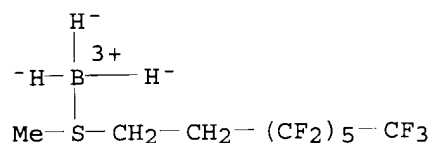


IT 655226-78-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of recyclable fluorous borane-sulfides and their use in  
 large-scale hydroboration of alkenes or alkynes and reduction of organic  
 functional groups)

RN 655226-78-1 CAPLUS

CN Boron, trihydro[1,1,1,2,2,3,3,4,4,5,5,6,6-tridecafluoro-8-(methylthio-  
 $\kappa$ S)octane]-, (T-4)- (9CI) (CA INDEX NAME)



L5 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:768754 CAPLUS

DOCUMENT NUMBER: 138:24318

TITLE: Fluorous Dimethyl Sulfide: A Convenient, Odorless,  
 Recyclable Borane Carrier

AUTHOR(S): Crich, David; Neelamkavil, Santhosh

CORPORATE SOURCE: Department of Chemistry, University of Illinois,  
 Chicago, IL, 60607-7061, USA

SOURCE: Organic Letters (2002), 4(23), 4175-4177  
 CODEN: ORLEF7; ISSN: 1523-7060

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 138:24318

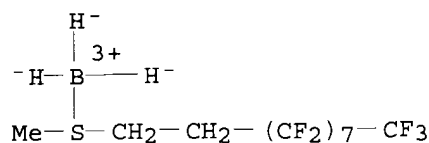
AB Borane gas and 2-(perfluorooctyl)ethyl Me sulfide form a solid comprised  
 of an approx. 1:1 mixture (fluorous BMS) of sulfide and the corresponding  
 sulfide-borane. Fluorous BMS permits hydroboration of alkenes in a  
 dichloromethane/perfluorinated hydrocarbon mixture with subsequent recycling  
 of the fluorous sulfide by fluorous extraction The use of fluorous BMS in the  
 asym. reduction of ketones catalyzed by a chiral oxazaborolidine catalyst, and  
 in the reduction of other functional groups, is also reported.

IT 478308-95-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (fluorous di-Me sulfide as recyclable borane carrier in hydroboration  
 and reduction reactions)

RN 478308-95-1 CAPLUS

CN Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-  
 $\kappa$ S)decane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:195218 CAPLUS

DOCUMENT NUMBER: 134:207964

TITLE: Economical and convenient procedures for the synthesis of catecholborane

INVENTOR(S): Brown, Herbert C.

PATENT ASSIGNEE(S): Sigma-Aldrich Co., USA

SOURCE: U.S., 6 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6204405	B1	20010320	US 1999-469274	19991222
PRIORITY APPLN. INFO.:			US 1999-469274	19991222

OTHER SOURCE(S): CASREACT 134:207964

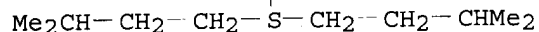
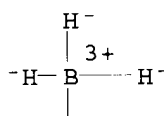
AB New, economical and convenient procedures for the preparation of catecholborane in high CP form using tri-O-phenylene bis borate, readily prepared from reaction of catechol with boric acid, and diborane or borane-Lewis base complexes is described. Thus, reaction of catechol with boric acid in PhMe gave tri-O-phenylene bis borate which on treatment with diborane gas gave catecholborane with 98% purity.

IT 183118-10-7

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with tri-O-phenylene bis borate)

RN 183118-10-7 CAPLUS

CN Boron, trihydro[1,1'-thiobis[3-methylbutane]]-, (T-4)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:609227 CAPLUS

DOCUMENT NUMBER: 133:335260

TITLE: Molecular Addition Compounds. 17. Borane and Chloroborane Adducts with Organic Sulfides for Hydroboration

AUTHOR(S): Zaidlewicz, Marek; Kanth, Josyula V. B.; Brown, Herbert C.

CORPORATE SOURCE: H. C. Brown Center for Borane Research, Purdue University, West Lafayette, IN, 47907, USA

SOURCE: Journal of Organic Chemistry (2000), 65(20), 6697-6702  
CODEN: JOCEAH; ISSN: 0022-3263

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 133:335260



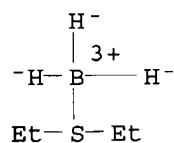
AB The following sulfides were examined as borane carriers in comparison with di-Me sulfide and 1,4-oxathiane: tert-Bu Me sulfide, isoamyl Me sulfide, Et isoamyl sulfide, tert-Bu isoamyl sulfide, diisoamyl sulfide, tetrahydrothiophene, tetrahydro-thiopyran, thioanisole, 3-ethylthiotetrahydrofuran, bis(3-tetrahydrofuryl) sulfide, and bis(2-methoxyethyl) sulfide. Their complexing ability toward borane increases in the following order: thioanisole < ether-sulfides < dialkyl sulfides < di-Me sulfide. Borane adducts of the sulfides are liqs. >0°. The thioanisole adduct loses diborane at room temperature. The reactivity of the adducts toward 1-octene increases in the reversed order of the complexing ability of the sulfides. Diisoamyl sulfide has a mild, ethereal, agreeable aroma, its synthesis is economical and the borane adduct, 4.2M in BH<sub>3</sub>, is stable over prolonged periods at room temperature. The sulfide can be recovered from hydroboration-oxidation products by distillation. Consequently, diisoamyl sulfide is a new promising borane carrier. Bis(2-methoxyethyl) sulfide, easily synthesized from the low cost thiodiethanol, is three times more soluble in H<sub>2</sub>O than 1,4-oxathiane. Its borane adduct is 6.0M in BH<sub>3</sub> and can substitute for more expensive borane-1,4-oxathiane in hydroboration reactions. Applications of these new borane adducts in the synthesis of mono- and dichloroborane adducts was also studied. The equilibrium ratios observed for the new chloroborane adducts were similar to that observed for di-Me sulfide adducts. However, the hydroboration of 1-octene with these new chloroborane adducts are much faster than the corresponding adducts of di-Me sulfide, which are currently used extensively.

IT 55606-71-8 151183-12-9 183118-06-1  
183118-08-3 183118-09-4 183118-10-7  
183118-13-0

RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)  
(formation and hydroboration of alkenes by)

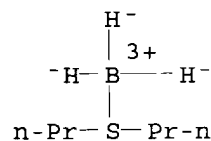
RN 55606-71-8 CAPLUS

CN Boron, trihydro[1,1'-thiobis[ethane]]-, (T-4)- (9CI) (CA INDEX NAME)



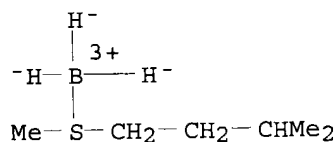
RN 151183-12-9 CAPLUS

CN Boron, trihydro[1,1'-thiobis[propane]]-, (T-4)- (9CI) (CA INDEX NAME)

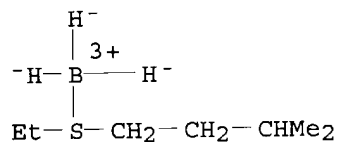


RN 183118-06-1 CAPLUS

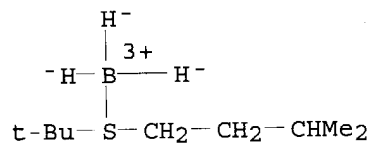
CN Boron, trihydro[3-methyl-1-(methylthio)butane]-, (T-4)- (9CI) (CA INDEX NAME)



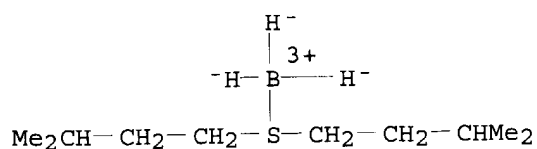
RN 183118-08-3 CAPLUS  
 CN Boron, [1-(ethylthio)-3-methylbutane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)



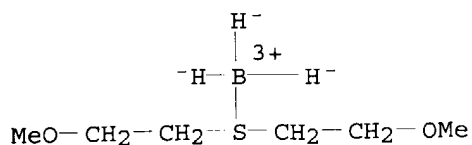
RN 183118-09-4 CAPLUS  
 CN Boron, [1-[(1,1-dimethylethyl)thio]-3-methylbutane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)



RN 183118-10-7 CAPLUS  
 CN Boron, trihydro[1,1'-(thio-bis[3-methylbutane])]-, (T-4)- (9CI) (CA INDEX NAME)



RN 183118-13-0 CAPLUS  
 CN Boron, trihydro[1,1'-(thio-κS)bis[2-methoxyethane]]-, (T-4)- (9CI) (CA INDEX NAME)



REFERENCE COUNT:

29

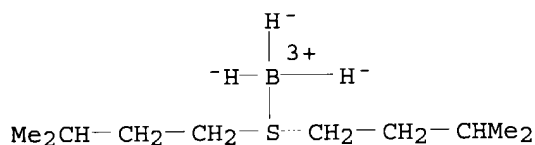
THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 1996:657071 CAPLUS  
 DOCUMENT NUMBER: 125:301225  
 TITLE: Borane-sulfide hydroboration agents  
 INVENTOR(S): Brown, Herbert C.  
 PATENT ASSIGNEE(S): Aldrich Chemical Company, Inc., USA  
 SOURCE: U.S., 6 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

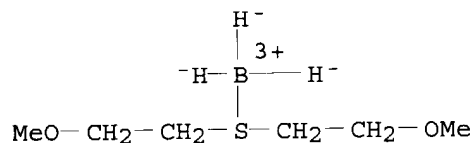
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5567849	A	19961022	US 1995-437582	19950509
PRIORITY APPLN. INFO.:			US 1995-437582	19950509

OTHER SOURCE(S): MARPAT 125:301225

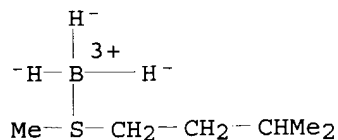
AB A borane-sulfide represented by the formula  $\text{BH}_3\cdot\text{SR}_1\text{R}_2$  wherein  $\text{R}_1$  and  $\text{R}_2$  each are straight or branched chain alkyl or alkoxy with at least one R being a branched chain when both  $\text{R}_1$  and  $\text{R}_2$  are alkyl is described. The compds. are hydroboration agents.  
 IT **183118-10-7P 183118-13-0P**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation and hydroboration with)  
 RN 183118-10-7 CAPLUS  
 CN Boron, trihydro[1,1'-thiobis[3-methylbutane]]-, (T-4)- (9CI) (CA INDEX NAME)



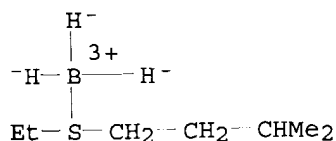
RN 183118-13-0 CAPLUS  
 CN Boron, trihydro[1,1'-(thio-κS)bis[2-methoxyethane]]-, (T-4)- (9CI)  
 (CA INDEX NAME)



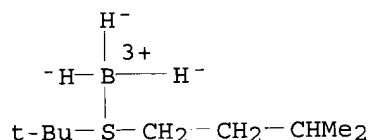
IT **183118-06-1P 183118-08-3P 183118-09-4P**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of)  
 RN 183118-06-1 CAPLUS  
 CN Boron, trihydro[3-methyl-1-(methylthio)butane]]-, (T-4)- (9CI) (CA INDEX NAME)



RN 183118-08-3 CAPLUS  
 CN Boron, [1-(ethylthio)-3-methylbutane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)



RN 183118-09-4 CAPLUS  
 CN Boron, [1-[(1,1-dimethylethyl)thio]-3-methylbutane]trihydro-, (T-4)- (9CI) (CA INDEX NAME)



L5 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1991:414091 CAPLUS  
 DOCUMENT NUMBER: 115:14091  
 TITLE: Borane-organosilicon preceramic polymers, their manufacture, and ceramics formed from these polymers  
 INVENTOR(S): Seyferth, Dietmar; Plenio, Herbert  
 PATENT ASSIGNEE(S): Massachusetts Institute of Technology, USA  
 SOURCE: Eur. Pat. Appl., 28 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 424082	A2	19910424	EP 1990-311309	19901016
EP 424082	A3	19910710		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE				
US 5171736	A	19921215	US 1989-421586	19891016
CA 2027669	AA	19910417	CA 1990-2027669	19901015
JP 03221531	A2	19910930	JP 1990-277602	19901016
			US 1989-421586	19891016

PRIORITY APPLN. INFO.:

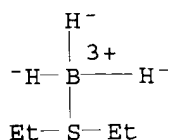
AB The polymers are the reaction products of multiple Si-H and Si-N functional group-containing organosilicon oligomers or polymers and a borane, with the molar ratio of organosilicon polymer repeating units:borane being ≤15:1. The ceramics are formed by pyrolyzing the preceramic polymers. The preceramic polymers are soluble in organic solvents and/or fusible, and give high Si nitride-B nitride yields.

IT **55606-71-8**

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with silazanes, for preceramic polymers)

RN 55606-71-8 CAPLUS

CN Boron, trihydro[1,1'-thiobis[ethane]]-, (T-4)- (9CI) (CA INDEX NAME)



L5 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1975:541236 CAPLUS

DOCUMENT NUMBER: 83:141236

TITLE: Reactions of pentaborane(11) with ethers

AUTHOR(S): Kodama, Goji; Saturnino, Dennis J.

CORPORATE SOURCE: Dep. Chem., Univ. Utah, Salt Lake City, UT, USA

SOURCE: Inorganic Chemistry (1975), 14(9), 2243-9

CODEN: INOCAJ; ISSN: 0020-1669

DOCUMENT TYPE: Journal

LANGUAGE: English

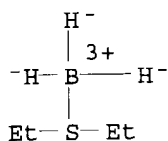
AB Reactions of pentaborane(11) with ethers were studied at low temps. by means of  $^{11}\text{B}$  NMR spectroscopy. The reactions of  $\text{B}_5\text{H}_{11}$  with dimethyl and diethyl thioethers gave the sym. cleavage products  $\text{R}_2\text{S.BH}_3$  and  $\text{R}_2\text{S.B}_4\text{H}_8$ . Species that are produced in the reaction system of  $\text{B}_5\text{H}_{11}$  and oxoethers are very dependent upon the base strength of the ether. Strongly basic THF can effect the unsym. cleavage of  $\text{B}_5\text{H}_{11}$  to produce  $\text{H}_2\text{B}(\text{THF})_2 + \text{B}_4\text{H}_9^-$ . Evidence for the formation of this cleavage product is based on NMR spectral evidence and on the observed reaction products produced in the reaction of  $\text{HCl}$  with the  $\text{B}_5\text{H}_{11}$ -THF system. A 2nd species is observable in the THF- $\text{B}_5\text{H}_{11}$  system which is more predominant at higher temps. This species is the simple adduct  $\text{B}_5\text{H}_{11}.\text{THF}$ . Moderately basic ethers like  $\text{Me}_2\text{O}$  and  $\text{Et}_2\text{O}$  produce only 1 observable species which is considered to be  $\text{B}_5\text{H}_{11}.\text{OR}_2$ . Weakly basic iso- $\text{Pr}_2\text{O}$  does not react with  $\text{B}_5\text{H}_{11}$ . No direct evidence for the sym. cleavage of  $\text{B}_5\text{H}_{11}$  by oxoethers was observed. The similarities and differences between these reactions and analogous  $\text{B}_4\text{H}_{10}$  reactions are discussed.

IT 55606-71-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 55606-71-8 CAPLUS

CN Boron, trihydro[1,1'-thiobis[ethane]]-, (T-4)- (9CI) (CA INDEX NAME)



=> FIL CASREACT

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
35.92	196.82

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-4.85	-4.85

CA SUBSCRIBER PRICE

FILE 'CASREACT' ENTERED AT 15:22:51 ON 12 MAY 2004  
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT

COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE CONTENT:1840 - 9 May 2004 VOL 140 ISS 19

Some records from 1974 to 1991 are derived from the ZIC/VINITI data file and provided by InfoChem and some records are produced using some INPI data from the period prior to 1986.

This file contains CAS Registry Numbers for easy and accurate substance identification.

Crossover limits have been increased. See HELP RNCROSSOVER for details.

Structure search limits have been raised. See HELP SLIMIT for the new, higher limits.

=> D ACC 138:24318 ALL

ANSWER 1 CASREACT COPYRIGHT 2004 ACS on STN

AN 138:24318 CASREACT

TI Fluorous Dimethyl Sulfide: A Convenient, Odorless, Recyclable Borane Carrier

AU Crich, David; Neelamkavil, Santhosh

CS Department of Chemistry, University of Illinois, Chicago, IL, 60607-7061, USA

SO Organic Letters (2002), 4(23), 4175-4177

CODEN: ORLEF7; ISSN: 1523-7060

PB American Chemical Society

DT Journal

LA English

CC 21-2 (General Organic Chemistry)

AB Borane gas and 2-(perfluorooctyl)ethyl Me sulfide form a solid comprised of an approx. 1:1 mixture (fluorous BMS) of sulfide and the corresponding sulfide-borane. Fluorous BMS permits hydroboration of alkenes in a dichloromethane/perfluorinated hydrocarbon mixture with subsequent recycling of the fluorous sulfide by fluorous extraction. The use of fluorous BMS in the asym. reduction of ketones catalyzed by a chiral oxazaborolidine catalyst, and in the reduction of other functional groups, is also reported.

ST fluorous borane sulfide prepn hydroboration asym redn; olefin hydroboration fluorous borane sulfide; ketone asym redn oxazaborolidine fluorous borane sulfide; ester redn fluorous borane sulfide; nitrile redn fluorous borane sulfide; amide redn fluorous borane sulfide

IT Hydroboration

Reduction

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Alcohols, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Reduction

(stereoselective; of acetophenone with fluorous di-Me sulfide as recyclable borane carrier)

IT 110205-59-9  
 RL: CAT (Catalyst use); USES (Uses)  
 (fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 98-86-2, Acetophenone, reactions 127-91-3,  $\beta$ -Pinene 591-49-1, 1-Methylcyclohexene 2043-53-0 10387-40-3, Potassium thioacetate 13389-42-9, trans-2-Octene 17416-73-8 22049-87-2 22364-68-7 157989-22-5 219937-71-0  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 19287-45-7P, Diborane 125640-21-3P 478296-48-9P 478308-95-1P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

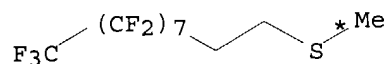
IT 123-96-6P, 2-Octanol 589-98-0P, 3-Octanol 1517-69-7P, (R)-1-Phenylethanol 7443-52-9P, trans-2-Methylcyclohexanol 15358-92-6P, cis-Myrtanol 55755-16-3P 145510-21-0P 448957-53-7P 478296-49-0P 478296-50-3P 478296-51-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 16940-66-2, Sodium borohydride  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prereactant with boron trifluoride etherate; fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 109-63-7, Boron trifluoride etherate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prereactant with sodium borohydride; fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

- (1) Braun, L; J Org Chem 1971, V36, P2388
- (2) Brown, H; J Am Chem Soc 1961, V83, P2544 CAPLUS
- (3) Brown, H; J Am Chem Soc 1970, V92, P1637 CAPLUS
- (4) Brown, H; J Org Chem 1977, V42, P1392 CAPLUS
- (5) Brown, H; J Org Chem 1992, V57, P4970 CAPLUS
- (6) Brown, H; J Org Chem 2001, V66, P4795 CAPLUS
- (7) Brown, H; Organic Synthesis via Boranes 1975
- (8) Bruncko, M; J Org Chem 1994, V59, P5543 CAPLUS
- (9) Corey, E; Angew Chem, Int Ed 1998, V37, P1987
- (10) Corrie, J; J Chem Soc, Perkin Trans 1 1996, P1583 CAPLUS
- (11) Crich, D; J Am Chem Soc 2001, V123, P7449 CAPLUS
- (12) Crich, D; Org Lett 1999, V1, P269 CAPLUS
- (13) Crich, D; Org Lett 2000, V2, P4029 CAPLUS
- (14) Crich, D; Org Lett 2000, V2, P989 CAPLUS
- (15) Crich, D; Org Lett 2002, V4, P2573 CAPLUS
- (16) Crich, D; Tetrahedron 1999, V55, P14261 CAPLUS
- (17) Crich, D; Tetrahedron 1999, V55, P1569 CAPLUS
- (18) Crich, D; Tetrahedron 2002, V58, P3865 CAPLUS
- (19) Curran, D; Angew Chem, Int Ed 1998, V37, P1174
- (20) Curran, D; Tetrahedron 2002, V58(20)
- (21) Follet, M; Chem Ind 1986, P123 CAPLUS
- (22) Horvath, I; Acc Chem Res 1998, V31, P641 CAPLUS
- (23) Lane, C; J Org Chem 1974, V39, P1437 CAPLUS
- (24) Ogawa, A; J Org Chem 1997, V62, P450 CAPLUS
- (25) Smith, K; Comprehensive Organic Synthesis 1991, V8, P703
- (26) Zaidlewicz, M; EROS 1995, V1, P634
- (27) Zaidlewicz, M; EROS 1995, V1, P638
- (28) Zweifel, G; J Am Chem Soc 1964, V86, P393 CAPLUS
- (29) Zweifel, G; Org React 1963, V13, P1 CAPLUS

$$\begin{array}{ccc} \text{Ac}^* - \text{S} - \text{CH}_2 - \text{CH}_2 - (\text{CF}_2)_7 - \text{CF}_3 & \text{H}_3\text{C}^* - \text{I} & \\ \text{A} & \text{B} & \end{array} \quad \xrightarrow{(1)}$$


```

RX(1)          RCT  A 125640-21-3

                STAGE(1)
                  RGT  D 124-41-4 NaOMe
                  SOL  67-56-1 MeOH

                STAGE(2)
                  RCT  B 74-88-4
                  PRO  C 478296-48-9

```

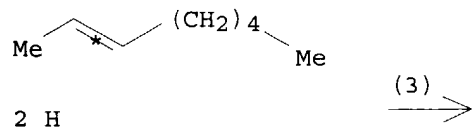
C

$\text{MeS}-\text{CH}_2-\text{CH}_2-(\text{CF}_2)_7-\text{CF}_3$

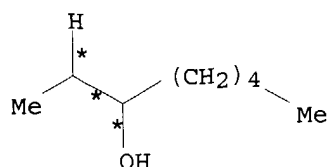
(2)

F

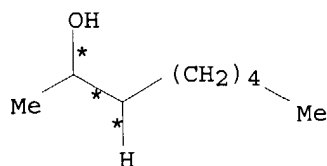
$\text{H}^-$   
 $\text{H}^-$   
 $-\text{H}-\text{B}_{3+}$   
 $\text{Me}-\text{S}$   
 $(\text{CF}_2)_7-\text{CF}_3$

$$RX(3) \text{ OF } 15 \quad 2 \text{ H} \implies I + J$$






I  
YIELD 90% (45)



J  
YIELD 90% (55)

RX(3) RCT H 13389-42-9

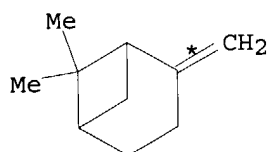
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

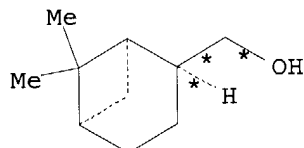
STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO I 589-98-0, J 123-96-6  
NTE stereoselective

RX(4) OF 15 O ==> P



O



P  
YIELD 91%

RX(4) RCT O 127-91-3

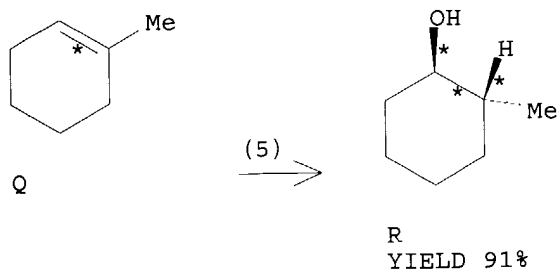
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO P 15358-92-6  
NTE stereoselective

RX(5) OF 15 Q ==> R



RX(5) RCT Q 591-49-1

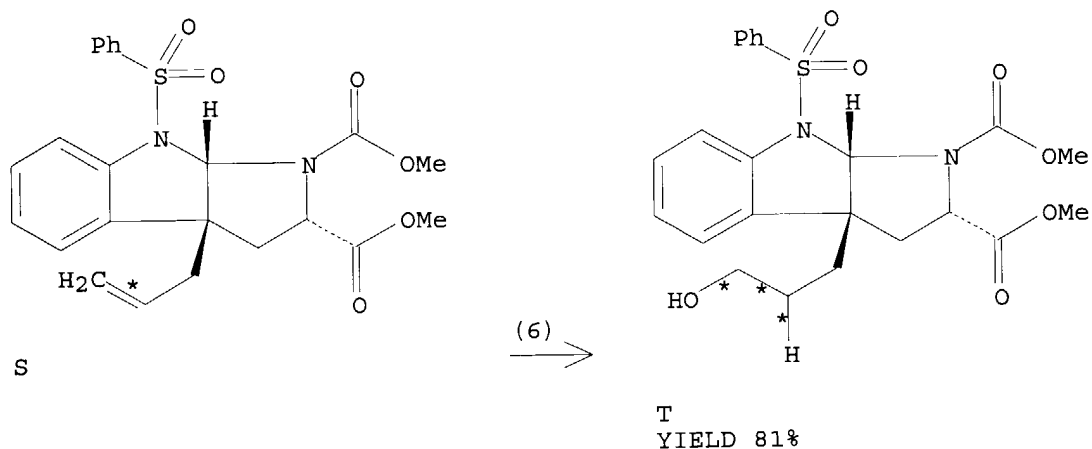
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-,  
 (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio)-  
 SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
 SOL 7732-18-5 Water  
 PRO R 7443-52-9  
 NTE stereoselective

RX(6) OF 15 S ==> T



RX(6) RCT S 157989-22-5

STAGE(1)

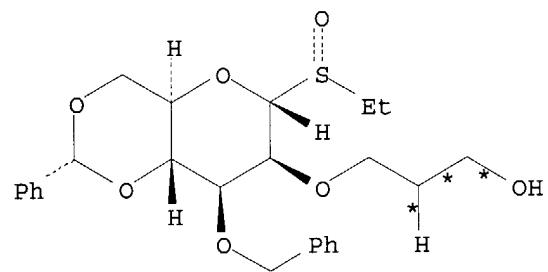
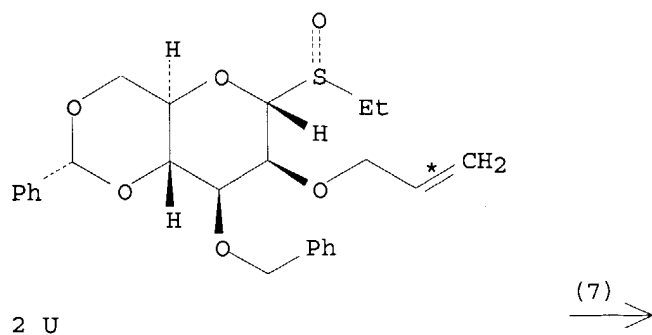
RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-,  
 (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio)-  
 SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

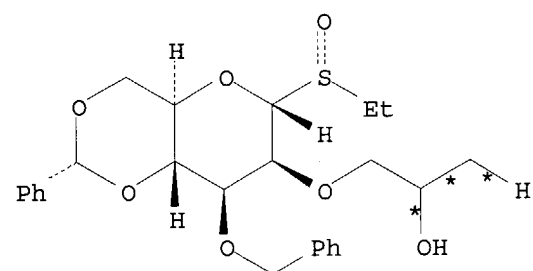
RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
 SOL 7732-18-5 Water

PRO T 478296-49-0  
NTE stereoselective

RX (7) OF 15            2 U    ==>   V   +   W



V  
YIELD 78% (75)



W  
YIELD 78% (25)

RX (7) RCT U 219937-71-0

STAGE (1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-

SOL 75-09-2 CH2Cl2

STAGE(2)

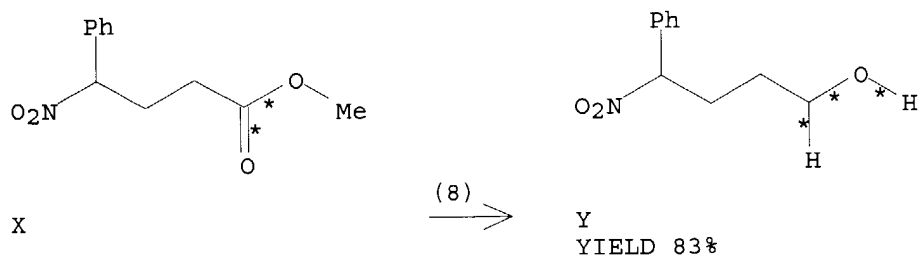
RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2

SOL 7732-18-5 Water

PRO V 478296-50-3, W 478296-51-4

NTE stereoselective

RX(8) OF 15 X ==> Y



RX(8) RCT X 22049-87-2

STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-

SOL 75-09-2 CH2Cl2

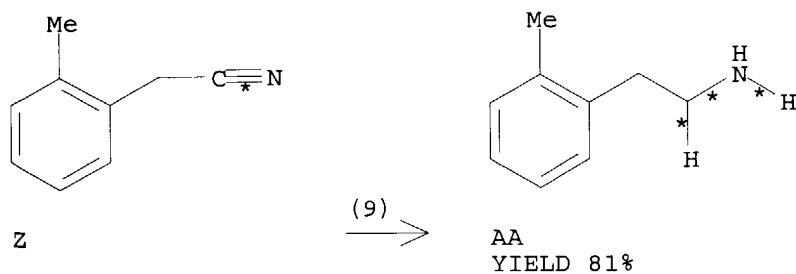
STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2

SOL 7732-18-5 Water

PRO Y 145510-21-0

RX(9) OF 15 Z ==> AA



RX(9) RCT Z 22364-68-7

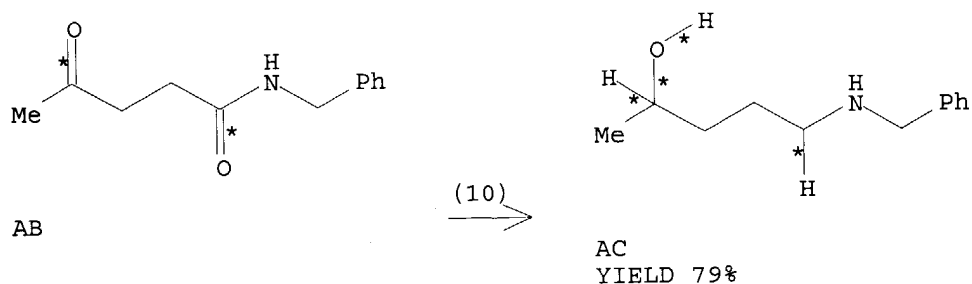
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-

SOL 75-09-2 CH2Cl2

STAGE(2)  
 RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2  
 SOL 7732-18-5 Water  
 PRO AA 55755-16-3

RX(10) OF 15 AB ==> AC

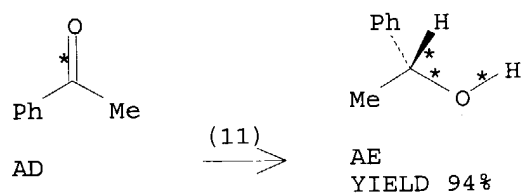


RX(10) RCT AB 17416-73-8

STAGE(1)  
 RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio)-  
 SOL 75-09-2 CH2Cl2

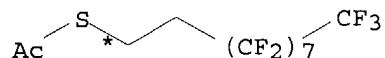
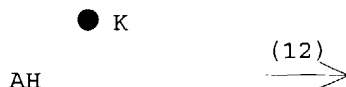
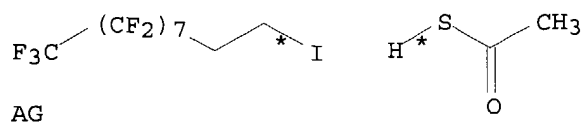
STAGE(2)  
 RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2  
 SOL 7732-18-5 Water  
 PRO AC 448957-53-7

RX(11) OF 15 AD ==> AE



RX(11) RCT AD 98-86-2  
 RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-  
 PRO AE 1517-69-7  
 CAT 110205-59-9 1H,3H-Pyrrolo[1,2-c][1,3,2]oxazaborole, tetrahydro-3,3-diphenyl-, (3aS)-  
 SOL 75-09-2 CH2Cl2  
 NTE stereoselective

RX(12) OF 15 AG + AH ==> A...



A  
YIELD 81%

RX(12)     RCT   AG 2043-53-0, AH 10387-40-3  
              PRO   A 125640-21-3  
              SOL   68-12-2 DMF

=> FIL CASREACT

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	16.37	213.19
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-0.66	-5.51

FILE 'CASREACT' ENTERED AT 15:34:05 ON 12 MAY 2004  
 USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT  
 COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE CONTENT:1840 - 9 May 2004 VOL 140 ISS 19

Some records from 1974 to 1991 are derived from the ZIC/VINITI data file and provided by InfoChem and some records are produced using some INPI data from the period prior to 1986.

This file contains CAS Registry Numbers for easy and accurate substance identification.

Crossover limits have been increased. See HELP RNCROSSOVER for details.

Structure search limits have been raised. See HELP SLIMIT for the new, higher limits.

=> D ACC 138:24318 ALL

ANSWER 1 CASREACT COPYRIGHT 2004 ACS on STN

AN 138:24318 CASREACT

TI Fluorous Dimethyl Sulfide: A Convenient, Odorless, Recyclable Borane Carrier

AU Crich, David; Neelamkavil, Santhosh

CS Department of Chemistry, University of Illinois, Chicago, IL, 60607-7061, USA

SO Organic Letters (2002), 4(23), 4175-4177

CODEN: ORLEF7; ISSN: 1523-7060

PB American Chemical Society

DT Journal

LA English

CC 21-2 (General Organic Chemistry)

AB Borane gas and 2-(perfluorooctyl)ethyl Me sulfide form a solid comprised of an approx. 1:1 mixture (fluorous BMS) of sulfide and the corresponding sulfide-borane. Fluorous BMS permits hydroboration of alkenes in a dichloromethane/perfluorinated hydrocarbon mixture with subsequent recycling of the fluorous sulfide by fluorous extraction. The use of fluorous BMS in the asym. reduction of ketones catalyzed by a chiral oxazaborolidine catalyst, and in the reduction of other functional groups, is also reported.

ST fluorous borane sulfide prepn hydroboration asym redn; olefin hydroboration fluorous borane sulfide; ketone asym redn oxazaborolidine fluorous borane sulfide; ester redn fluorous borane sulfide; nitrile redn fluorous borane sulfide; amide redn fluorous borane sulfide

IT Hydroboration

Reduction

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Alcohols, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT Reduction

(stereoselective; of acetophenone with fluorous di-Me sulfide as recyclable borane carrier)

IT 110205-59-9

RL: CAT (Catalyst use); USES (Uses)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 98-86-2, Acetophenone, reactions 127-91-3,  $\beta$ -Pinene 591-49-1,

1-Methylcyclohexene 2043-53-0 10387-40-3, Potassium thioacetate

13389-42-9, trans-2-Octene 17416-73-8 22049-87-2 22364-68-7

157989-22-5 219937-71-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 19287-45-7P, Diborane 125640-21-3P 478296-48-9P 478308-95-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

IT 123-96-6P, 2-Octanol 589-98-0P, 3-Octanol 1517-69-7P,

(R)-1-Phenylethanol 7443-52-9P, trans-2-Methylcyclohexanol

15358-92-6P, cis-Myrtanol 55755-16-3P 145510-21-0P 448957-53-7P

478296-49-0P 478296-50-3P 478296-51-4P

RL: SPN (Synthetic preparation); PREP (Preparation)

(fluorous di-Me sulfide as recyclable borane carrier in hydroboration and reduction reactions)

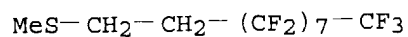
IT 16940-66-2, Sodium borohydride



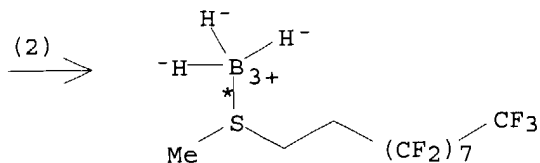


STAGE(2)  
 RCT B 74-88-4  
 PRO C 478296-48-9

RX(2) OF 15 ...C ==> F



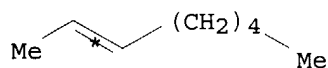
C



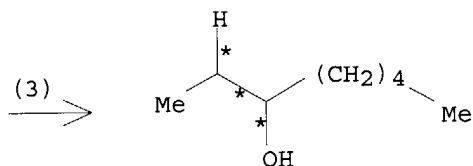
F

RX(2) RCT C 478296-48-9  
 RGT G 19287-45-7 B<sub>2</sub>H<sub>6</sub>  
 PRO F 478308-95-1  
 NTE reagent generated in situ

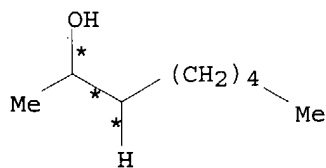
RX(3) OF 15 2 H ==> I + J



2 H



I  
 YIELD 90%(45)



J

YIELD 90%(55)

RX(3) RCT H 13389-42-9

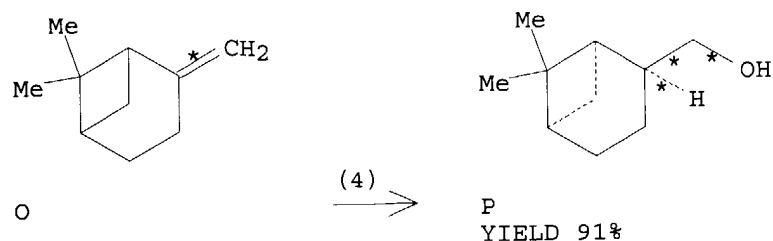
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptafluoro-10-(methylthio)-  
 SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2  
 SOL 7732-18-5 Water  
 PRO I 589-98-0, J 123-96-6  
 NTE stereoselective

RX(4) OF 15 O ==> P



RX(4) RCT O 127-91-3

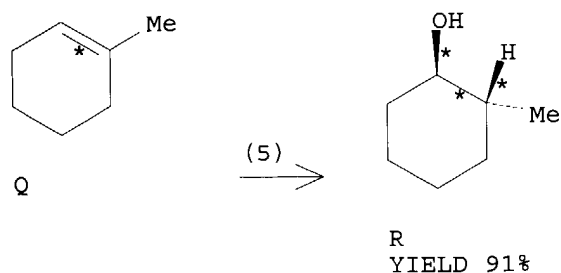
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
 SOL 75-09-2 CH2Cl2

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2  
 SOL 7732-18-5 Water  
 PRO P 15358-92-6  
 NTE stereoselective

RX(5) OF 15 Q ==> R



RX(5) RCT Q 591-49-1

STAGE(1)

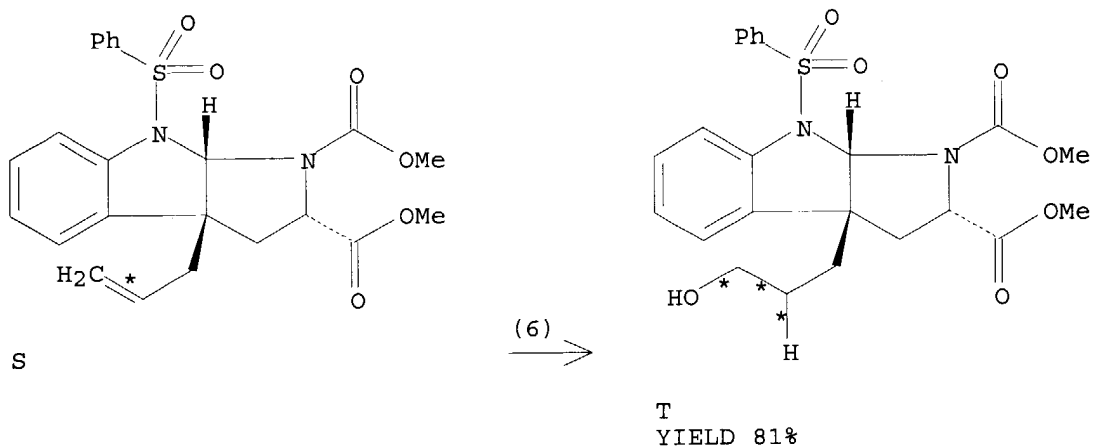
RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
 SOL 75-09-2 CH2Cl2

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2

SOL 7732-18-5 Water  
 PRO R 7443-52-9  
 NTE stereoselective

RX(6) OF 15 S ==> T



RX(6) RCT S 157989-22-5

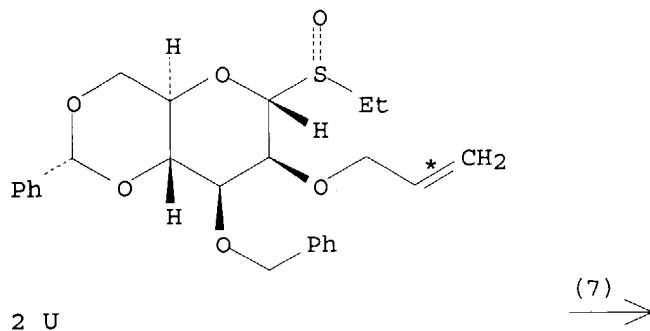
STAGE(1)

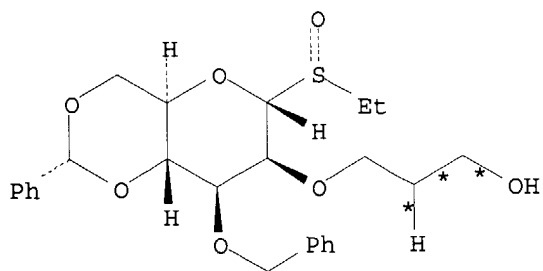
RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
 SOL 75-09-2 CH2Cl2

STAGE(2)

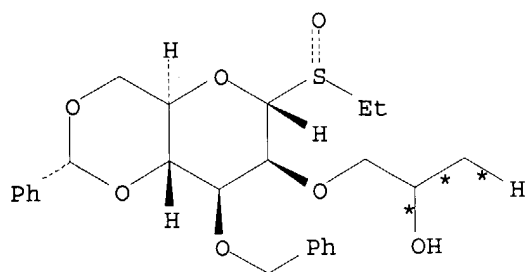
RGT K 1310-73-2 NaOH, L 7722-84-1 H2O2  
 SOL 7732-18-5 Water  
 PRO T 478296-49-0  
 NTE stereoselective

RX(7) OF 15 2 U ==> V + W





V  
YIELD 78% (75)



W  
YIELD 78% (25)

RX(7) RCT U 219937-71-0

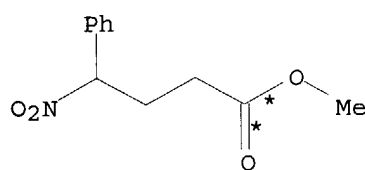
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

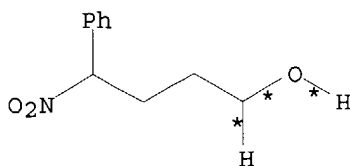
STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO V 478296-50-3, W 478296-51-4  
NTE stereoselective

RX(8) OF 15 X ==> Y



X



Y  
YIELD 83%

RX(8) RCT X 22049-87-2

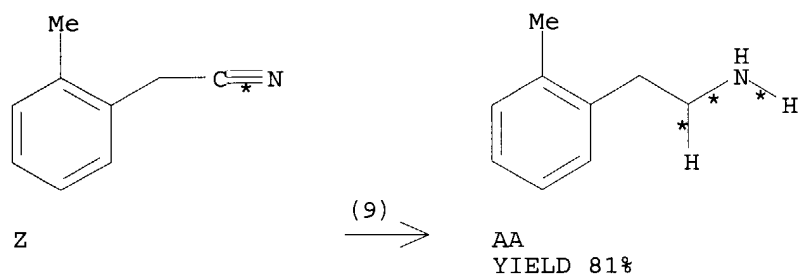
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-,  
(T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,  
,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO Y 145510-21-0

RX(9) OF 15 Z ==> AA



RX(9) RCT Z 22364-68-7

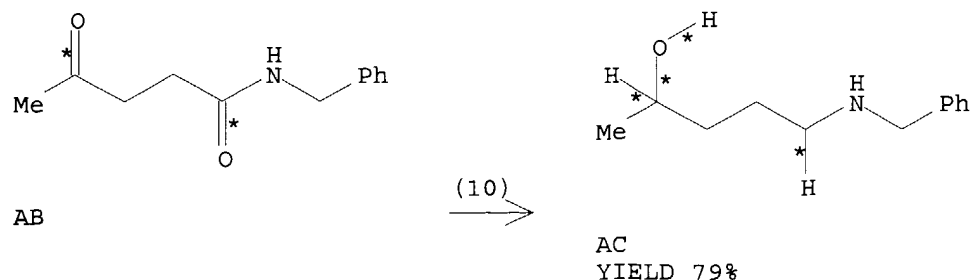
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-,  
(T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,  
,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO AA 55755-16-3

RX(10) OF 15 AB ==> AC



RX(10) RCT AB 17416-73-8

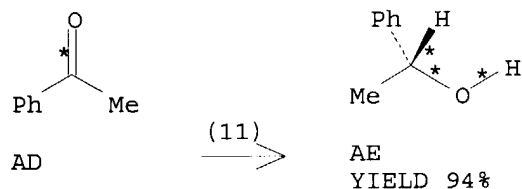
STAGE(1)

RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-, C 478296-48-9 Decane, 1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>

STAGE(2)

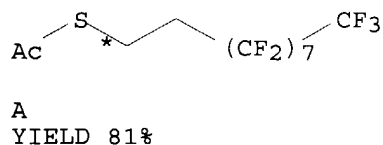
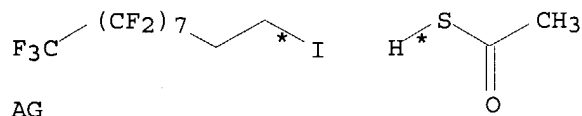
RGT K 1310-73-2 NaOH, L 7722-84-1 H<sub>2</sub>O<sub>2</sub>  
SOL 7732-18-5 Water  
PRO AC 448957-53-7

RX(11) OF 15 AD ==> AE



RX(11) RCT AD 98-86-2  
RGT F 478308-95-1 Boron, [1,1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-heptadecafluoro-10-(methylthio-κS)decane]trihydro-, (T-4)-  
PRO AE 1517-69-7  
CAT 110205-59-9 1H,3H-Pyrrolo[1,2-c][1,3,2]oxazaborole, tetrahydro-3,3-diphenyl-, (3aS)-  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>  
NTE stereoselective

RX(12) OF 15 AG + AH ==> A...



RX(12) RCT AG 2043-53-0, AH 10387-40-3  
PRO A 125640-21-3

SOL 68-12-2 DMF

=> file beilstein  
COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
10.49	223.68

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-0.66	-6.17

CA SUBSCRIBER PRICE

FILE 'BEILSTEIN' ENTERED AT 15:36:56 ON 12 MAY 2004  
COPYRIGHT (c) 2004 Beilstein-Institut zur Foerderung der Chemischen Wissenschaften  
licensed to Beilstein GmbH and MDL Information Systems GmbH

FILE RELOADED ON OCTOBER 20, 2002  
FILE LAST UPDATED ON MARCH 30,2004

FILE COVERS 1771 TO 2003.

\*\*\* FILE CONTAINS 8,932,479 SUBSTANCES \*\*\*

>>> PLEASE NOTE: Reaction data and substance data are stored in  
separate documents and can not be searched together in one  
query.

Reaction data for BEILSTEIN compounds may be displayed  
immediately with the display codes PRE (preparations) and REA  
(reactions). A substance answer set retrieved after the search  
for a chemical name, a molecular formula or a structure search  
for example can be restricted to compounds with available  
reaction information by concatenation with PRE/FA, REA/FA or  
more general with RX/FA. The BEILSTEIN Registry Number (BRN)  
is the link between a BEILSTEIN compound and belonging reactions.  
For more detailed reaction searches BRNs can be selected from  
substance answer sets and searched in the next step as reaction  
partner BRNs - Reactant (RX.RBRN) or Product BRN (RX.PBRN).  
After a search for reaction details substance documents  
associated with reactants or products may be retrieved by  
searching RX.PBRNs or RX.RBRNs as BRNs. <<<

>>> FOR SEARCHING PREPARATIONS SEE HELP PRE <<<

\*\*\*\*\*  
\* PLEASE NOTE THAT THERE ARE NO FORMATS FREE OF COST. \*  
\* SET NOTICE FEATURE: THE COST ESTIMATES CALCULATED FOR SET NOTICE \*  
\* ARE BASED ON THE HIGHEST PRICE CATEGORY. THEREFORE; THESE \*  
\* ESTIMATES MAY NOT REFLECT THE ACTUAL COSTS. \*  
\* FOR PRICE INFORMATION SEE HELP COST \*  
\*\*\*\*\*

=> d his

(FILE 'HOME' ENTERED AT 15:03:31 ON 12 MAY 2004)

FILE 'STNGUIDE' ENTERED AT 15:03:51 ON 12 MAY 2004

FILE 'REGISTRY' ENTERED AT 15:18:24 ON 12 MAY 2004

L1 STRUCTURE UPLOADED  
L2 0 S L1  
L3 25 S L1 FULL  
L4 9 S L3 AND 1/B

FILE 'CAPLUS' ENTERED AT 15:19:22 ON 12 MAY 2004

L5

7 S L4

FILE 'CASREACT' ENTERED AT 15:22:51 ON 12 MAY 2004

FILE 'CASREACT' ENTERED AT 15:34:05 ON 12 MAY 2004

FILE 'BEILSTEIN' ENTERED AT 15:36:56 ON 12 MAY 2004

=> s l1 full

FULL SEARCH INITIATED 15:37:06 FILE 'BEILSTEIN'

FULL SCREEN SEARCH COMPLETED - 1495 TO ITERATE

100.0% PROCESSED 1495 ITERATIONS

0 ANSWERS

SEARCH TIME: 00.00.11

L6

0 SEA SSS FUL L1

=> file gmelin

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.06

223.74

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

CA SUBSCRIBER PRICE

0.00

-6.17

FILE 'GMELIN' ENTERED AT 15:37:24 ON 12 MAY 2004

COPYRIGHT (C) 2004 MDL Information Systems GmbH

FILE LAST UPDATED: 03 MAY 97 - 21 MAY 97 <970503/UP -970521/UP>

>>> CAS REGISTRY NUMBERS FOR 171,499 SUBSTANCES AVAILABLE <<<

>>> FILE CONTAINS 1,070,350 SUBSTANCES <<<

>>> PLEASE NOTE THAT AFTER A SEARCH IN SSTA FIELDS DIS QRD OR  
DIS HIT CAN BE VERY LENGTHY. <<<

\*\*\*\*\*  
\* SET NOTICE FEATURE: THE COST ESTIMATES CALCULATED FOR PREDEFINED \*  
\* FORMATS ARE BASED ON THE SUM OF ALL FIELDS POSSIBLE. THEREFORE; \*  
\* THESE ESTIMATES MAY NOT REFLECT THE ACTUAL COSTS. \*  
\* FOR PRICE INFORMATION SEE HELP COST. \*  
\*\*\*\*\*

=> s l1 full

FULL SEARCH INITIATED 15:37:30 FILE 'GMELIN'

FULL SCREEN SEARCH COMPLETED - 405 TO ITERATE

100.0% PROCESSED 405 ITERATIONS

0 ANSWERS

SEARCH TIME: 00.00.05

L7

0 SEA SSS FUL L1

=>

---Logging off of STN---